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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,152	09/03/2003	Chandra Mouli	M4065.0970/P970	2509
24998	7590	12/10/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			WILSON, ALLAN R	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	
			2815	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/653,152

Applicant(s)

MOULI, CHANDRA

Examiner

Allan R. Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 9-15 and 21-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-8 and 16-20, in the reply filed on 11/15/2004 is acknowledged.

Information Disclosure Statement

The information disclosure statement filed October 8, 2003 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because Cite No. CA does not contain a title, author or date. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-8 and 16-20 are rejected under 35 USC § 103 (a) as being unpatentable over McClure, U.S. Patent No. 6,780,666 B1 (or Applicants Prior Art) in view of Tews et al. ("Tews") U.S. Patent No. 6,362,040 B1.

With regards to claim 1, McClure illustrates in figures 1-6, a photosensor 12 having a first doped region 12a and a second doped region 12b in association with a semiconductor substrate 14; an isolation region 32 formed within said substrate.

McClure does not show a halogen-rich region localized at least at a sidewall region of said isolation region. Tews illustrates in at least figure 5 a halogen-rich region localized at least at a sidewall region 123 of an isolation region. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a halogen-rich region for oxidizing trench sidewalls which reduces crystallographic orientation dependence.

With regards to claim 2, Tews illustrates in fig. 5 said halogen-rich region is in the sidewalls of the trench and therefore when combined with Lin said halogen-rich region will be between said isolation region and said photosensor.

With regards to claims 3 and 17, Tews discloses in col. 5, lines 35-36, said halogen-rich region is formed with an ion selected from the group consisting of fluorine and bromine.

With regards to claim 4 Tews illustrates in fig. 5 said halogen-rich region is in the sidewalls of the trench and therefore when combined with McClure said halogen-rich region and said first doped region 12a of said photosensor will overlap.

With regards to claims 5 and 16, McClure and Tews discloses the claimed invention except for said halogen-rich region has a depth from a surface of said semiconductor substrate of about 300Å to about 800Å. It would have been obvious to one of ordinary skill in the art at the

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time the invention was made to have a depth of 300Å to about 800Å, since it has been held that where the general conditions of a claim are disclosed in the prior art discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

With regards to claim 6, Tews discloses in col. 5, lines 48-51, said halogen-rich region has a concentration of halogen ions from about $1 \times 10^{14}/\text{cm}^3$ to about $1 \times 10^{15}/\text{cm}^3$.

With regards to claims 7 and 18, McClure illustrates in figures 1-6 a charge collection region 18 electrically connected to readout circuitry 24, 26, 28.

With regards to claims 8 and 19, McClure illustrates in figs. 1-6 a transfer transistor 16 formed between and connecting said photosensor 12 and said charge collection region 18.

With regards to claim 20, McClure illustrates in figs. 1-6 a reset transistor 22 electrically connected to said charge collection region 18.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Lin (illustrates a photosensor with an isolation trench) and Armacost et al. (illustrates a halogen-rich region in the sidewall of a trench).

Field of Search	Date
U.S. Class and subclass: 257/93, 374, 446	December 8, 2004
Other Documentation: None	N/A
Electronic data base(s): EAST (USPAT, US-PGPUB, JPO, EPO, Derwent, IBM TDB)	December 8, 2004

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is

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(571) 272-1738. Examiner Wilson can normally be reached 7:00-4:00 Monday-Thursday and 6:00-3:00 on Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'A. Wilson', with a long horizontal flourish extending to the right.

Allan R. Wilson
Primary Examiner
8 December 2004